



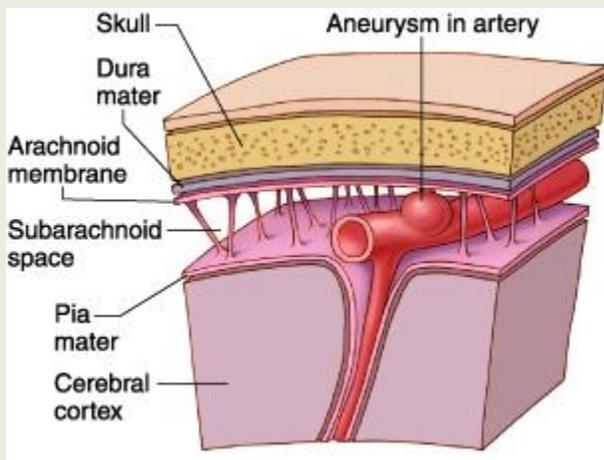
## Medicine for Managers

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# Subarachnoid Haemorrhage

As anyone might guess, subarachnoid haemorrhage is bleeding into the subarachnoid space. But what is it? Why does it happen and is it serious? It was recognised in the time of Hippocrates and yet up to half of the bleeds are still fatal today. It is a true emergency and anyone suspected of having a bleed should be removed to hospital by 999 ambulance. Even so, one in eight will die before arriving.

Subarachnoid haemorrhages account for about 7% of all strokes.



The bleeding occurs in a layer of the structure covering the brain. Called the **meninges**, they are membranous coverings of the brain and spinal cord and are in three layers, from the outside inwards called the **dura mater**, the **arachnoid mater** and the **pia mater**.

Their functions are to carry the blood vessels supplying the brain and to provide a protective covering.

The arachnoid mater, the middle layer consists of connective tissue and beneath it are blood vessels. Through it passes the **cerebro-spinal fluid** which has complex functions in terms of nutrition, protection and cushioning.

Sometimes one of the blood vessels has an **aneurysm**, which is a bulge in the vessel wall. It is caused by a weakness and, under certain rare circumstances, the area will burst (**rupture**) causing a bleed.

A haemorrhage in this area has very serious consequences. The aneurysm itself does not usually cause any symptoms unless it ruptures, although 2-6% of patients may experience headaches, unilateral facial pain or visual disturbances with an unruptured aneurysm.

Aneurysms may develop because of:

- Raised blood pressure
- Excessive alcohol consumption
- Family history
- Rarely a brain tumour or infection

The most common cause of subarachnoid haemorrhage is the **congenital berry aneurysm**. It is so described because it appears like a cluster of berries. They gradually enlarge and

weaken the wall of the artery. Aneurysms are most common between the ages of 40 and 65.

Many aneurysms do not rupture and the affected individuals remain ignorant of their presence throughout their whole lives.

### **Symptoms of subarachnoid haemorrhage**

A subarachnoid haemorrhage is usually a sudden and severe event and is often brought on by an exertional event including coughing, straining, raging with anger or having sex. A blow to the head may also cause a bleed. The symptoms include:

- A sudden extremely severe headache
- A very stiff neck
- Photophobia
- Nausea and vomiting
- Irritability and confusion
- Classic stroke symptoms including weakness or paralysis on one side of the body and difficulty or loss of speech.
- Collapse, convulsions and loss of consciousness

Some people say that they feel a 'popping sensation' in the head before the symptoms develop.

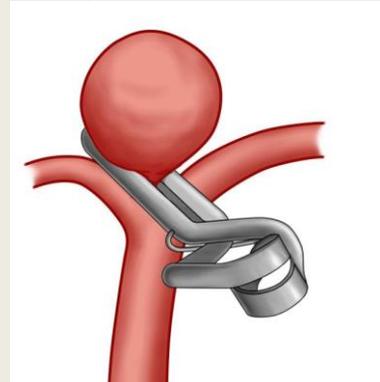
The development of scans revolutionised the diagnosis of subarachnoid haemorrhage. A CT is a first line diagnostic tool but if the symptoms suggest a bleed which is not confirmed on scan, then a lumbar puncture is carried out where cerebro-spinal fluid is drawn out from the subarachnoid space in the lower spine. If the fluid contains blood, the diagnosis is confirmed and a specialist neurologist will probably undertake **angiography** (outlining blood vessels in the head using a radio-opaque dye) which will be viewed either by CT or MRI scan. It is estimated that a principal cause of misdiagnosis

occurs because over half of suspected sufferers do not get a scan.

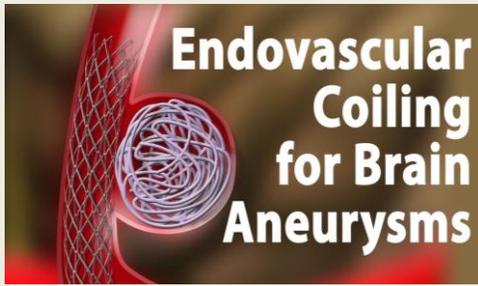
### **Treatment of subarachnoid haemorrhage**

Success with subarachnoid haemorrhage depends usually on speedy diagnosis and transfer to an appropriate unit. (**specialist neurosciences unit** or **intensive care unit**). Treatment may include some or all of:

- Sedation
- Pain relief
- Drugs to control and manage blood flow through the vessels of the brain
- Other drugs as required, such as anti-emetics to control sickness and anti-convulsants to control seizures
- Surgery, used to clip or close the aneurysm to prevent future recurrent bleeds. This is a permanent repair. It may be carried by
  - (a) **Clipping**. Under a general anaesthetic a **craniotomy** is performed; this involves making a hole in the bone of the skull to give the surgeon access to the brain. The aneurysm is located and a clip is placed around its base to seal it and to prevent it growing or rupturing again.



- (b) **Endovascular coiling**. This is performed under a general anaesthetic. A catheter is passed along



a cerebral (brain) vessel and into the aneurysm under imaging. Tiny platinum coils are then passed into the aneurysm until full at which point it is sealed from the main artery preventing further rupture or bleeding.

Some patients will need to continue with anti-convulsant medication to prevent recurrent seizures or to prevent arterial spasm using a drug called *nimodipine*.

Patients may also suffer from anxiety which requires treatment. However, most important is to monitor blood pressure and to ensure that any hypertension (raised blood pressure) is well controlled.

### ***The Complications of subarachnoid haemorrhage***

1. The risk of a re-bleed is significant. This is a greater risk in those patients where an aneurysm has sealed itself.
2. Epilepsy. Damage as a result of the bleed may leave about one in twenty survivors with epileptic seizures.
3. Residual weakness or paralysis on one side of the body. This may be accompanied by sensory disturbances or peculiar sensations.
4. Headaches, tiredness and insomnia
5. Visual disturbances may persist.

In summary, a subarachnoid haemorrhage is serious. It is fatal in significant numbers of

cases, the recovery period is long and patients may be left with a variety of complications, particularly if you have other morbidities or if you are older. The quicker that care is sought and the more advanced the hospital to which the sufferer is taken, the better the chance of survival but despite even the most modern vascular techniques, deaths still occur irrespective of quality of care provided.

### ***History***

Despite Hippocrates' wisdom, aneurysms and their ability to rupture were not recognised until the eighteenth century.

In 1924, Sir Charles Symonds (1890-1978), graduate of Guy's Hospital, served in both world wars and ended in 1945 as an Air Vice Marshall. In 1924 he described the brain vasculature and the aetiology of subarachnoid haemorrhage, coined the term 'spontaneous subarachnoid haemorrhage' and described lumbar puncture to make the diagnosis.

Between the 1930s and the 1990s, there were developments in angiography, microsurgery, medication and the clipping of aneurysms. Dr Guido Guglielmi introduced endovascular coils as recently as 1991.

***Advice and Assistance*** is available from:

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